a1 Sub B1

an adaptable section between the handle section and the transducer section, the adaptable section operable to allow bending movement of and maintain the position of the handle section relative to the transducer section without steering wires.

a2 Sub B2

11. (amended) An intraoperative or endocavity ultrasound probe for insertion into a cavity or surgical incision of a patient, the probe comprising:

a transducer housing;

a handle housing; and

an adjustable section joining the transducer housing to the handle housing, the adjustable section having a flexible covering and a device to maintain an adjusted bent position of the transducer housing to the handle housing without steering wires.

REMARKS

The changes to the rewritten claim above are shown in the attached Appendix. In the Appendix, additions are designated by underlining, and deletions are indicated with brackets.

In the Office Action, the Examiner rejected claims 1, 3-11 and 13-18 pursuant to 35 U.S.C. §103(a) as being unpatentable over Fujio et al. (U.S. Patent No. 5,471,988) in view of Nakamura et al. (U.S. Patent No. 5,469,852) and Abenaim (U.S. Patent No. 5,235,964). Claims 2, 12 and 19-26 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Fujio et al. in view of Nakamura et al. and Abenaim and in further view of Dias (U.S. Patent No. 5,488,955) and Law et al. (U.S. Patent No. 5,469,853). Applicants respectfully request reconsideration of claims 1-26, including independent claims 1, 11 and 19.

Independent claim 1 requires an adaptable section operable to allow bending movement of and maintain the position of the handle section relative to the transducer section without steering wires. Likewise, independent claim 11 requires a adjustable section having a device to maintain an adjusted bent position without steering wires. None of the relied upon references disclose these limitations.

Dias discloses a waveguide probe that may rotate about the longitudinal axis for imaging (col. 2, lines 42-48; FIG. 1). A motor rotates the waveguide (col. 4, lines 9-14). Dias does not suggest a waveguide with an adaptable or adjustable section, nor does Dias teach movement or maintaining an adjusted bent position with or without steering wires.

Fujio et al., Nakamura et al., Abenaim and Law et al. all rely steering wires for adjusting and maintaining the position of the transducer relative to the handle. Nakamura et al. disclose a multi-plane TEE probe with the standard ability to rotate the transducer array, such as rotating a wheel (col. 5, lines 17-20 and 58-60). A pair of wires for rotating the transducer array are wound around a pulley and extend to an operational part or handle with a control knob (col. 5, lines 60-66 and col. 6, lines 30-32). Nakamura et al. allow circular rotation of the transducer, but do not suggest an adaptable or adjustable section for bent positioning of the handle relative to the transducer. Nakamura et al. provide adjustment and maintain the position of the transducer array with steering wires controlled from the handle. Nakamura et al. do not suggest an adaptable or adjustable section to maintain a position without steering wires.

In Fujio et al., wires 29 are fixed to the distal end and extend through the curvature part to the rotary element 37/31 (col. 11, lines 21-28). The curvature operation knob at the operation part 30 (i.e. handle) moves or curves the curvature part with the wires (col. 9, lines 50-53 and col. 11, lines 29-35). Fujio et al. provide steering wires for curving the probe while in use within a patient. Fujio et al. do not suggest an adaptable or adjustable section to maintain a position without steering wires.

Like Fujio et al., Abenaim has an articulating mechanism 14 controlled by control wires 22 (col. 4, lines 46-49). By manipulating the wires, the articulation mechanism is caused to bend a desired amount (col. 5, lines 10-20). Figures 1-4 show the wires 22 extending beyond the articulating mechanism with directional arrows showing adjustement for steering the mechanism after insertion (see col. 1, lines 5-9). Abenaim provides steering wires for curving the probe while in use within a patient. Abenaim does not suggest an adaptable or adjustable section to maintain a position without steering wires.

Law et al. include rigid arms pivotally connected by a pin (col. 30, lines 62-65). A manipulating cable passes over a bearing such that the surgeon can manipulate the ends of the

cable to effect a bending of the second arm relative to the first arm (col. 30, line 66-col. 31, line 10). Law et al. provide steering wires for curving the probe while in use within a patient. Law et al. do not suggest an adaptable or adjustable section to maintain a position without steering wires.

Dependent claims 2-10, 12-18 and 26 depend from the independent claims 1 and 11 discussed above. Accordingly, these dependent claims are allowable for the reasons discussed above for the independent claims. Further limitations of the dependent claims distinguish these claims from the cited references. For example, the Examiner does not cite to disclosure of: the adaptable section comprising a metal shaft as claimed in claims 5 and 15, the aluminum wire as claimed in claim 6, a latch in the adaptable section as claimed in claims 9, 10 and 17 and material more malleable in response to external force than absent the external force as claimed in claim 26. Furthermore, Applicants respectfully disagree that Abenaim discloses a ball joint. The rack and pinion for tensioning the steering wires is not a ball joint and is shown spaced from the adjustable or adaptable section. Claims 7, 8 and 16 require the adaptable section to comprise a ball joint.

Claim 19 requires rotating a first axis of a transducer housing relative to second axis of a handle housing prior to inserting the probe into a cavity of a patient. None of the references disclose this limitation. As discussed above, the references disclose steering wires and other devices for moving portions of the probes by controls at the handle. The control at the handle is provided so that the probe can be adjusted while within a patient. For example, Abenaim discloses insertion and then "subsequent" manipulation by a wire system (col. 1, lines 5-9). Nakamura et al. suggest imaging within the patient and then rotating the array for continued imaging in the patient (col. 1, lines 12-29). Providing these steering mechanisms suggest adjustment after inserting the probe into a cavity of the patient. The references do not suggest rotating prior to inserting the probe into a cavity of a patient.

Dependent claims 20-26 depend from the independent claim 19 discussed above. Accordingly, these dependent claims are allowable for the reasons discussed above for the independent claim. Further limitations of the dependent claims distinguish these claims from

the cited references. For example, the Examiner does not cite to disclosure of: bending a metal shaft as claimed in claim 22, increasing a malleability of the probe in response to an external force prior to rotation as claimed in claim 25. As discussed above, the rack and pinion of Abenaim is not a ball joint, so the references do not disclose adjusting a ball joint as claimed in claim 23.

CONCLUSION:

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at (650) 694-5810 or Craig Summerfield at (312) 321-4726.

Respectfully submitted,

6/27/02

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Dated: June 27, 2002

APPENDIX

1. (amended) In an intraoperative ultrasound probe for insertion into a patient, the intraoperative ultrasound probe having a handle section and a transducer section, the transducer section including a transducer, an improvement comprising:

an adaptable section between the handle section and the transducer section, the adaptable section operable to allow bending movement of and maintain the position of the handle section relative to the transducer section without steering wires.

11. (amended) An intraoperative or endocavity ultrasound probe for insertion into a cavity or surgical incision of a patient, the probe comprising:

a transducer housing;

a handle housing; and

an adjustable section joining the transducer housing to the handle housing, the adjustable section having a flexible covering and a device to maintain an adjusted bent position of the transducer housing to the handle housing without steering wires.